Hands-On: Composing Maps for Print (& more!)

— Overview: What is the Print Composer?

- Print Composer allows you to export a map from QGIS. It can output an image in many different formats (.**pdf**, .**jpeg**, .**png**, .**tif**, etc.) which do not require special software to view.
- The Print Composer brings the styled layers in the map view onto a canvas, to which you can add a scalebar, legend, title, north arrow, credits, etc.
- A Project can have multiple Print Composers, allowing you to store multiple map layouts.

— Task 1: Create a New Composer

1. Click on the "New Composer" button (found on the File Toolbar)
2. Enter a name for this print composer (e.g. 'Map #1') and press OK. A new Print Composer window will open.
   a. Note: You can also create a new print composer via the Composer Manager, which allows you to view all print composers for a project, or to make new ones from a template. Handy!
3. The Composer Toolbar will appear by default on the left side of the composer window.
4. Check to see that the **Composition Panel** and **Item Properties Panel** are open on the right side of your screen (if not, activate them through the menu bar via *View > Panels*, or by right-clicking in the toolbar).
5. We will define the canvas size in the Composition Panel.
   a. In the **Presets** drop-down menu, select "*ANSI A (Letter; 8.5x11 in)*"
   b. You can use the **Orientation** menu to switch between portrait and landscape.

— Task 2: Add a Header

1. In the toolbar at left, click "Add New Label":
2. Click and drag to create a rectangular text box
3. Use the square handles (at the corners/borders of the map element) to resize.
   a. Make the box as wide as your canvas, and tall enough to hold a large font size
4. Go to the **Item Properties Panel**. Under "*Main Properties*", enter your map title into the text box, replacing the default text "QGIS".
5. Below, under "*Appearance*", check **center** for both 'horizontal alignment' and 'vertical alignment'. Here, you can also adjust text color & typeface.
6. Below, check the "*Frame*" and "*Background*" checkboxes
   a. Click on the color swatch to change the fill color. Change to a gray (85%).

— Task 3: Add the Map Element

1. In the toolbar, click "Add New Map": and click & drag on the canvas to add a map element. Resize to fit in the empty space on the canvas.
2. The new map element will automatically get the map extents from the QGIS map view

3. If desired, use the **Move Item Content** tool to refine the map extent:
   a. Click & drag to pan the map.
   b. Scroll to adjust the map extent (map must be selected)
      - Hold **ctrl** while scrolling to fine-tune
      - You can also manually enter a new scale for the map under the Item Properties Panel (best way to get exact numbers, e.g. 1:400,000)

— Task 4: Add a Scalebar
1. Add a scalebar to your map using the "Add New Scalebar" tool:
2. Click on the composer canvas to add a scalebar.
3. Under "*Main Properties*" in the **Item Properties Panel**, click the Style drop-down menu and select "Line Ticks Up".
4. Below, under "Units", select **feet.**
5. Below, under "Segments", you may adjust 'left' and 'right' to change how many segments are drawn.
6. More options are available, i.e. adjust line width under "Display", change fonts, etc.

— Task 5: Add a Map Legend
1. Lastly, let's add a simple legend element. Click "Add New Legend" in the toolbar:
2. In the Item Properties Panel, under "Legend Items", un-check '*Auto update*'
3. Select a legend item in the list
   a. Use the legend items toolbar to edit the legend:

   b. Bump an item up or down in the list using the arrow buttons
   c. Click on the notepad button to change the label for a given legend entry
      - change "wbdhu12_a_wi123" to "Subwatershed"
      - change "wbdhu10_a_wi123" to "Watershed"
      - change "wbdhu8_a_wi123" to "Basin"
4. Figure out the scale of your map
   a. Select the map element in the composer canvas. In the Item Properties Panel, look under "Main Properties" to get the map scale.
5. Add a new text box with the "Add New Label" tool:
6. In the Item Properties Panel, change the text:
   > **[Your Name], 07/26/2016**
   > **Projected in WISCRS Vernon Co.**
   > **Scale 1:X,XXX**
   > **Sources: USGS Watershed Boundaries**
   > **National Elevation Dataset (1 arc-second)**

— Task 6: Export the Map
1. In the Files Toolbar, click "Export as Image":

2. Choose a name and file path to save to
3. Select .pdf from the drop-down menu at the bottom of the dialogue
    a. Use .jpeg for small file sizes
    b. Use .tiff or .png if you want lossless image formats
4. Press OK!

— BONUS: Add a North Arrow
1. Let's add a North arrow to the map! Click "Add Image" in the toolbar:
2. While holding shift, click & drag to create a square image element (shift locks ratio)
3. In Item Properties Toolbar, under "Search Directories", find the directory **svg/arrows**
4. Scroll through & select a north arrow icon
5. Adjust the image sizing & placement using the Select/Move Item tool:
    a. Click & drag to move an item
        - While dragging, hold shift to lock item along one axis
    b. Click to select an item. A bounding box with square handles will appear to show that the item is selected. Click & drag on the handles to resize
        - Side handles resize in one dimension only
        - Corner handles allow you to resize width & height
        - While resizing, hold shift to lock aspect ratio (scale proportionally)
        - While resizing, hold alt to scale symmetrically